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MEASURING LEARNING STYLES AND LEARNING STIMULUS AMONG SECONDARY SCHOOL STUDENTS

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Abstract

This study examines learning styles and learning stimulus among secondary school students in Malaysia. A total of 50 students from Sekolah Menengah Kebangsaan Ungku Aziz, Sabak Bernam in Selangor were interviewed to measure student's different styles. The adapted version of Dunn and Dunn Learning Styles Inventory were used as in this study. The findings showed that majority students preferred on grouping learning styles (M=4.07), visual learning styles (M= 3.88), auditory learning styles (M=3.66), individual learning styles (M=3.61) and kinesthetic learning styles (M= 4.07) respectively. Based on the findings, several suggestions have been made to enhance the academic achievement for students. The results of this study

provide useful information for teachers and students which are important for the process of learning.

Keywords

Learning Style, Learning Stimulus, Visual Learning Styles, Auditory Learning Styles, Tactile Learning Styles, Sociological

1. Introduction

Learning style can be described as a particular manner based on which an individual learning and thinking, a preferred ways of acquiring knowledge and habits and strategies associated with learning (Pritchard 2005; Emamipour & Hassan, 2010). This article aimed at exploring auditory, visual, individual, kinesthetic and tactile learning styles among secondary school students. Measuring learning styles is one of the important issues that have been attracted by the attention of the researchers in education. A learning style is the way in which an individual consistently responds to stimuli and uses them in the context of learning (Nivedhitha& Chetan, 2016). The learning processes that students engage in are vital to their academic success (Jason et al 2015).

The study adopted Dunn and Dun (1989) learning style which explored five learning style stimuli and several elements within each stimulus: Environmental, Emotional, Sociological, Physiological and Psychological processing. Ferrett (2009) state that auditory learner may create rhymes out of words and play music that helps them to concentrate. According to Noridah (1999), auditory students benefit from hearing audio tapes, lectures and class discussion. According to Ferret (2009), kinaesthetic learners like to collect samples, write out information, spend time outdoors, and relate to do the material they are learning. They remember information well when they are actively participating in activities such in field trips and role playing in the classroom. Ferrett (2009) said that kinaesthetic learner tend to; create an experience, use models and physical activity, relate abstract information to something concrete, and use hands-on activities or computer games.

Research is needed to understand the relationship between student achievement and the motivation and attitude of students who have different learning styles. The specific objectives of this study are to: (1) examine dominant learning styles among students at secondary school, (2)

identify dominant learning stimulus among students at secondary school and; determine the relationship between learning styles and learning stimulus among students at secondary school.

1.1 Literature Review

Research about learning styles derived from various studies that are related to psycho-cognitive, social, and physiological aspects of the education process (Emamipour &Hassan, 2010). Hedge (2001) described learning styles as the concept of learning strategy used by learners to deal with the input, assimilate new language, store, retrieve, and practice using it.

Keefe (1979) has defined learning styles as the composition of cognitive, effective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment. Researchers and educators recognizes that students learn in different ways (Sprenger, 2003). According to Qais (2011) people learn differently based on their individual unique styles of learning. Hence, it is argued that learning style varies from one to another as described by Hoffler, et al. (2011).

A recent study was conducted by Bhat and Govil (2014) explored the differences in learning styles in relation to gender, residential background and type of institution. Students learn best when they have the opportunity to do 'hands-on' experience with materials like working in the laboratory, handing and building models, and touching. Besides that, writing notes can help them remember information, and physical involvement in class related activities may help them understand new information (Noridah, 1999).

Other studies showed that learning styles are influenced by culture, gender, and ethnicity background. Besides these, the other factors such as culture and the birth arrangement characteristics influence learning styles (Emamipour & Hassan, 2010; Sternberg, 1997; Merrifiel, 1996; Reid, 1987; Sakalli, 2009).

2. Research Methodology

This research was conducted using cross-sectional survey and analyzed using descriptive analysis. The study was conducted among form four students in Sekolah Menengah Kebangsaan Ungku Aziz, Sabak Bernam, and Selangor, Malaysia. The data is collected based on primary sources. A total of 50 students were used as the respondents of this study. For measuring Student's Learning Styles, the study used Learning Styles Inventory was invented by Dunn, Dunn and Price (1978). The variables of respondent's attitudes were measured using five points Likert Scales. In response to each of the items, respondents made their ratings on a five point

scale, pointing whether they (1) strongly disagree (2) disagree (3) neutral (4) agree and (5) strongly agree. Data from the questionnaires were analyzed using SPSS version 16. The outcomes were analyzed to determine the correlation.The analysis of the study consists of frequency, percentage, means, and standard deviation. The analysis of the study consists of frequency, percentage, means, and standard deviation independent t-test and Pearson correlation. The overall process of analysis is as follows:

Table 1: *Data Analysis*

1.	To examine learning styles (visual, auditory, tactile, kinaesthetic, grouping and individual) according gender.	Frequency, percentage, means, and standard deviation Independent *t*-test
2.	To identify learning stimulus (environmental, emotional, sociological, physical and psychological) according gender	Frequency and percentage,
3.	Relationship between learning styles and academic achievement of students.	Pearson correlation

Moreover, a pilot study was conducted in order to reliability test of the instrument. A total of 15 students were used as the respondents for the pilot study.

3. Results and Discussion

3.1 Auditory Learning Style

Literature suggests that auditory learners learn best by hearing information. They would have difficulties understanding a text if they read it, but if they listen they will be able to capture more quickly. Therefore, the listening comprehension tests are usually higher than the results they show on reading comprehension tests (Abbas, 2012). Pritchard (2005) stated that auditory learners have good auditory memory and there benefited from discussion, lectures, interviewing, hearing stories and audio tapes. Individual gains knowledge from reading out loud in the classroom and may not have a full understanding of information that is written (Abbas, 2012). The findings of this study showed (Table 1.2) that 42.0 percent students understand when teacher gives direction on some aspects. Moreover, a large number of students stated that when they hear phone number, they can remember without writing it down.

Table 2: *Auditory Learning Style*

Statement	Students N=50						
	SD	**D**	**N**	**A**	**SA**	**M**	**SD**
	N (%)	**N (%)**	**N (%)**	**N (%)**	**N (%)**		
1. I can more remember things that I hear in class than reading	1 (2.0)	4 (8.0)	19 (38.0)	17 (34.0)	9 (18.0)	3.58	.95
2. I remember things more easily when I repeat them a loud	1 (2.0)	5 (10.0)	13 (26.0)	22 (44.0)	9 (18.0)	3.66	.96
3. I better understand something when teacher gives direction	-	2 (4.0)	6 (12.0)	21 (42.0)	21 (42.0)	4.22	.82
4. I learn more when someone tells how to implements something in class	-	6 (12.0)	13 (26.0)	23 (46.0)	8 (16.0)	3.66	.90
5. When I hear a phone number, I can remember without writing it down	9 (18.0)	7 (14.0)	12 (2.0)	9 (18.0)	13 (26.0)	3.20	1.44
Average value of Mean						**3.66**	

M= Mean
SD= Standard Deviation

Bender (2008) claims that students learning styles seem to be good in hand-tools when they get the opportunity not only of hearing the material but also of talking with other students in a nonthreatening manner.

3.2 Visual Learning Style

The study examines visual learning style among students at secondary school. Visual learning- preference includes using pictures, diagrams, graphs, flow charts, arrows circles, hierarchies, etc. in order to learn (Nivedhitha, 2016). The results (Table 1.3) of this study revealed that the highest number of students (36 percent) can remember what they see well than what they hear. Similarly, a large number of respondents (34.0 percent) prefer to learn by reading than by listening the radio. In other hand, students agree when they more understand when instruction read by themselves. The kinds of learning preferences fall under perceptual learning

style, where visual learner learns more through seeing (Reid, 1995). Clearly, visual learners are most comfortable with picture, maps, graphs, images and diagrams in retaining such information. The highest score mean 4.82 (SD= 0.85) on item 6 "I remember what I see well than what I hear".

Table 3: *Visual Learning Style*

Statement	Students N=50						
	SD	D	N	A	SA	M	SD
	N (%)	N (%)	N (%)	N (%)	N(%)		
6. I remember what I see better than what I hear	-	2 (4.0)	10 (20.0)	20 (40.0)	18 (36.0)	4.08	.85
7. I can better understand a new article by reading about it in the paper than by listening the radio	-	1 (2.0)	14 (28.0)	18 (36.0)	17 (34.0)	4.02	.84
8. I understand when I read instruction by myself	1 (2.0)	1 (2.0)	13 (26.0)	22 (44.0)	13 (26.0)	3.90	.89
9. I learn better by reading what teacher writes on the whiteboard	-	6 12.0	7 (14.0)	29 (58.0)	8 (16.0)	3.78	.86
10. Seeing a number makes more sense to me than hearing a number	1 (2.0)	3 (6.0)	17 (34.0)	21 (42.0)	8 (16.0)	3.64	.90
Average value of Mean						**3.38**	

M= Mean; SD= standard deviation

As usual, students who prefer on visual learning styles always used to adapt something new in their life. For example, a video with colorful character demonstrating might effect on students' memory better than teacher's instruction on how to do this. These ways just a simple vivid image that might influenced in students' attention.

3.3 Kinesthetic Learning Style

In kinesthetic Learning Style learners learns best through "hands-on" approach. Most of the time kinaesthetic learners have a difficult time staying on target and can become unfocused effortlessly (Abbas, 2012). The present study examines kinesthetic Learning Style using five scales (Table1.4) and the results showed that the highest mean score was on items 11 (M= 4.06, SD= 1.00). This was followed by items 15 (M= 3.82, SD= 1.25) followed by items 14 (M= 3.76, SD= 1.09) respectively. These results showed that students learn best through class

activities, taking part in the presentation and involvement in class activities. Kelly (2010) revealed that Kinesthetic learners are those who learn best through touching, feeling, and experiencing that which they are trying to learn. They remember best by writing or physically manipulating the information.

Table 4: *Kinaesthetic Learning Style*

Statement	Students N=50						
	SD	D	N	A	SA	M	SD
	N (%)	N (%)	N (%)	N (%)	N (%)		
11. I like to learn by doing something in class	3 (6.0)	2 (4.0)	11 (22.0)	9 (18.0)	25 (50.0)	4.06	1.00
12. I learn well by doing some action in class	2 (4.0)	5 (10.0)	10 20.0	10 (20.0)	23 (46.0)	2.10	1.04
13. I feel happy on learning by group presentation	5 (10.0)	1 2.0	26 52.0	1 2.0	17 34.0	2.82	.91
14. I learn more when I take part from group presentation	4 (8.0)	8 (16.0)	9 (18.0)	12 24.0	17 (34.0)	3.76	1.09
15. learn best when I participate in activities in class	3 (6.0)	4 (8.0)	5 (10.0)	10 (20.0)	27 (54.0)	3.82	1.25
Average value of mean						**3.54**	

M= Mean & SD= Standard Deviation

3.4 Individual Learning Style

It is very important to understand and explore each individual's learning style. Discovering this learning style will allow the student to determine his or her own personal strengths and weaknesses and learn from them (Abbas, 2012). The study examines individual learning style using five statement (Table 1.5) and the highest score was recorded for "I can't learn when classmate was playing around me" (48 percent) and 30.0 percent students learn best when no one is around respectively. The total average of value mean was 3.61. It was indicated that the s most of students preferred to study along when no one is in around as the findings shown that 48.0 percent of respondents (3.98 of score means) strongly agree who can't learn when classmate was playing in around.

Table 5: *Individual Learning Style*

Statement	Students N=50						
	SD	D	N	A	SA	M	SD
	N (%)	N (%)	N (%)	N (%)	N (%)		
16. I study best when no one is around	4 (6.0)	5 (10.0)	6 (12.0)	20 (40.0)	15 (30.0)	3.74	1.23
17. When I study alone, I remember things better	1 (2.0)	3 (6.0)	14 (28.0)	17 34.0	15 (30.0)	3.84	1.00
18. I can't learn when classmate was playing around me	3 (6.0)	4 (8.0)	8 (16.0)	11 (22.0)	24 (48.0)	3.98	1.24
19. It is more fun to learn with classmate at first, but it is hard to study with them	2 (4.0)	4 (8.0)	15 (30.0)	18 (36.0)	11 (22.0)	3.64	1.05
20. I hate listening music when I study	12 (24.0)	12 (24.0)	10 (20.0)	3 (6.0)	13 (26.0)	2.86	1.53
Average value of mean						**3.61**	

M= Mean; SD= standard deviation

3.5 Learning Stimulus among Students

The study examines learning stimulus (Table 1.6) with respect to environmental, emotional, sociological, physical and psychological aspects. The findings revealed that student more likely to learn in brightness, quiet and cold environment. Students do not comfortable to learn in dark and noise places. Sound is considered as a factor on stimulus environment in learning. People react differently to different sounds and this needs to be considered in stimulus environment. On psychological aspect, the number respondents (14% agree and 40% strongly agree) stated that they prefer to learn when the data is shown in the graph. The highest score was recorded on "I'm very confident to achieve good result in academic achievement". These results showed that student's determination is important for the academic achievement. This indicates that students had shown emotional as stimulus on learning.

Table 6: *Learning Stimulus*

Statements	Students N=50				
	SD	**D**	**N**	**A**	**SA**
	N (%)	**N (%)**	**N** (%)	**N (%)**	**N (%)**
1. I study best when eating and drinking	10 (20.0)	10 (20.0)	12 (24.0)	7 (14.0)	11 (22.0)
2. I'm very confident to achieve good result in academic achievement	-	3 (6.0)	21 (42.0)	23 (46.0)	3 (6.0)
3. have time table on learning	10 (20.0)	10 (20.0)	8 (16.0)	16 (32.0)	6 (12.0)
4. I struggle most for the difficult subject	1 (2.0)	10 (20.0)	13 (26.0)	13 (26.0)	11 (22.0)
5. I like discussing the topic in groups	10 (20.0)	8 (16.0)	13 (26.0)	15 (30.0)	4 (8.0)
6. I learn best in brightness quiet and cold environment	1 (2.0)	-	6 (12.0)	21 (42.0)	22 (44.0)
7.When someone shown me data in graph, I learn most	3 (6.0)	3 (6.0)	7 (14.0)	20 (40.0)	17 (34.0)

3.6 Relationship between Learning Styles with Learning Stimulus

As the aim of this study is to determine if there is a correlation between learning style and learning stimulus, correlation analyses were conducted to analyze the relationship between learning styles (grouping, individual, visual, auditory, kinaesthetic, and tactile) with learning stimulus (environment, psychology, sociological, emotional, and physical) among students. The results of the analysis show significant relationships between learning style and learning stimulus among students (Table 1.7).

Table 7: *Relationship between Learning Style and Learning Stimulus (N=50)*

Relationship	Pearson correlation value (r)	Significant 2 tailed (p)	Level of relationship
Learning styles with learning stimulus	0.443	0.001	Medium

The researcher was used Pearson Correlation (significant at 2-tailed) as a method.From these results (Table 1. 7) it could be said that there is positive association between learning style and learning stimulus have as the r value is 0.443**, which indicates as the correlation is significant at the 0.01 level.

3. Conclusions

This study examined learning styles among secondary school students in Malaysia. The finding revealed that the highest average of mean was recorded grouping learning styles followed by visual learning styles auditory learning styles, individual learning styles and kinesthetic learning styles respectively. The findings showed the lowest preferred on learning by students is kinaesthetic. The results of this study provide useful information for teachers and students which are important for the process of learning. The study suggests that grouping learning style is important style that allow students to accommodate student diversity. Similarly, the visual learning style allows the student to determine his or her own personal strengths and weaknesses. Visual learning styles, teachers may use stimulation and games as strategies in learning. When using visual component it makes easier for the students to remember the content of learning. The result of this study also showed the significant relationships between learning style and learning stimulus among students. The current research was able to manage to distribute 50 respondents only. Therefore, the results of this study could not be generalized to a broader scope. Further research with a larger number of respondents is required for the deeper understanding of measuring learning style among students at secondary school.

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